Amendments to the Specification

Please delete the line on page 1, line 1, as follows:

~~DESCRIPTION~~

Please replace the two paragraphs beginning at page 1, line 25 by the following paragraphs:

As prior art relative to the above, for example, in Japanese ~~Unexamined~~ Patent ~~Application, First~~ Publication No. S56-38617, there is described a constant voltage device that controls voltage by utilizing heat radiation from a PTC ceramic layer 1B provided between input electrodes 2, 3 and the output electrode 6.

In the latter polymeric PTC thermistor that can interrupt current flow at a desired timing, a heat source and apparatus to activate the heat source are required in addition to the former polymeric PTC thermistor, and there was a drawback because ~~in~~ the construction became complex and the manufacturing cost became higher. Another problem was that the module became large because there were many components.

Please replace the heading on page 2, line 13 by the following heading:

BRIEF DESCRIPTION ~~DISCLOSURE~~ OF THE INVENTION

Please replace the paragraph beginning on page 2, line 14 by the following paragraph:

The present invention provides a ~~A~~ thermistor of the present invention having a variable resistance part, whose resistance value changes in accordance with changes in temperature, between a first and a second electrode, the thermistor interrupting current between the first and second electrodes in response to changes in the resistance value of the variable resistance part, including: a third electrode placed so that it is not in contact with either the first or second electrode; and a heating part integrally formed with the same material as the variable resistance part and in contact with the third electrode, the heating part changing the resistance value of the variable resistance part by generating heat when current passes between the third electrode and either of the first or second electrodes ~~electrode~~.

Please replace the headings on page 5, lines 13-14 by the following heading:

DETAILED DESCRIPTION OF ~~BEST MODE FOR CARRYING OUT~~ THE INVENTION ~~(First Embodiment)~~

Please replace the five paragraphs beginning on page 5, line 21 by the following paragraphs:

The conductive polymer 6, from a plane view, is a rectangular sheet with a uniform thickness, and is a polymeric resin material made by kneading for example polyethylene and carbon black, then crosslinking by irradiation. Within the conductive polymer 6, carbon black particles are present linked to one another in a room temperature environment so that good conductivity is exhibited. When there is an overcurrent flowing through the conductive paths, the conductive polymer 6 thermally expands so that the distance between the carbon black particles is ~~are~~ extended to cut the conductive paths, and the resistance increases sharply. This is the positive temperature coefficient (PTC) mentioned above.

The electrode 1 is provided on one surface (the upper surface side in FIG. 1) of the section on the conductive polymer 6 forming the variable resistance part 3. The electrode 2 is provided on the other surface (the lower surface side in FIG. 1) forming the variable resistance part 3. The electrode 1 comprises a rectangular metal piece 1a and nickel foil 1b or the like sandwiched by the metal piece 1a and the conductive polymer 6. The electrode 2 also has the same construction and shape as the electrode 1, and comprises a rectangular metal piece 2a cut aligned to the side edge of the conductive polymer 6 and nickel foil 2b or the like sandwiched by the metal piece 2a ~~1a~~ and the conductive polymer 6.

The electrode 4 is provided on the other surface of the section of the conductive polymer forming the heating part 5. The electrode 4 also has the same construction and shape as the electrodes 1, 2, and comprises a rectangular metal piece 4a cut aligned to the side edge of the conductive polymer 6 and nickel foil 4b or the like sandwiched by the metal piece 4a ~~1a~~ and the conductive polymer 6. A parallel gap 7 is provided between the electrode 2 and the electrode 4; the other surface of ~~e~~ the conductive polymer 6 is exposed from this gap 7.

The polymeric PTC thermistor with the above construction uses the positive temperature coefficient of the conductive polymer 6 to function as a switch to trigger current flow between the electrodes 2, 4. The polymeric PTC thermistor is incorporated into part of a main circuit in an electrical product; if current passing through the electrodes 2, 4 is ~~are~~ equal to or below the prescribed size, thermal expansion is not so much as to cause a trip, but the thermistor is so constructed that it is heated and thermally expands when trigger current

flowing between the electrodes 2, 4 causes a prescribed section (thermal area described below) to generate heat.

In the polymeric PTC thermistor with the above construction, current flow between the electrodes 1, 2 is ~~are~~ maintained without any hindrance as long as a hold current of a size prescribed by the main circuit is flowing. However, if an ~~a~~ excessively large current compared with the hold current does not flow in the main circuit during an abnormality, or the amount of current flow in the main circuit is reduced radically on a discretionary basis, the conductive polymer 6 between the electrodes 2, 4 expands thermally when a trigger current flows, thereby increasing the resistance value and generating heat. The heating part 5 does not generate heat as a whole, but the section adjoining the variable resistance part 3 wherein the conductive polymer 6 is exposed through the formation of the gap 7 (thermal area in FIG. 2) generates heat locally. When the heating part 5 generates heat, the variable resistance part 3 formed integrally is heated and thermally expands, causing the internal conductive paths to be cut and the resistance to increase substantially, so that the amount of current flow between the electrodes 1, 2 is decreased radically.

Please replace the paragraph beginning on page 8, line 1 by the following paragraph:

Further, by adopting a construction wherein the variable resistance part 3 and the heating part 5 [[4]] are formed integrally in sheet form, with the first electrode being provided on one surface of the section forming the variable resistance part 3, the second electrode being provided on the other surface, and the third electrode being provided on either of the side surfaces of the section forming the heating part 5, attachment of each electrode to the integrally formed variable resistance part 3 and the heating part 5 is made easy and improvement in productivity may be achieved when manufacturing the polymeric PTC thermistor.

Please delete the line on page 8, line 18, as follows:

~~(Second Embodiment)~~

Please replace the two paragraphs beginning on page 8, line 22 by the following paragraphs:

In FIG. 3 through FIG. 5, in the same way as in the first embodiment, a polymeric PTC thermistor is shown. This polymeric PTC thermistor is, in the same way as in the first

embodiment, provided with a rectangular sheet-form conductive polymer 6. In ~~; in~~ this embodiment, the variable resistance part 3 is placed in the center, with two heating parts 5A, 5B provided on both sides thereof, and electrodes 4A, 4B are attached to the heating parts 5A, 5B respectively as the third electrode.

The electrode 1 is placed for the greater part on one surface (upper surface side in FIG. 3) of the center section, forming the variable resistance part 3, of the conductive polymer 6, while a portion is wrapped over the edge and placed on the other surface. The electrode 2 is placed for the greater part on the other surface (lower surface side in FIG. 3) of the center section, forming the variable resistance part 3, of the conductive polymer 6, while a portion is wrapped over the edge and placed on the one surface.

Please delete the line on page 10, line 1, as follows:

~~(Third Embodiment)~~

Please replace the three paragraphs beginning on page 10, line 5, by the following paragraphs:

In FIG. 6 and FIG. 7, in the same way as in the first embodiment, a polymeric PTC thermistor is shown. Unlike each of the embodiments above, this polymeric PTC thermistor is provided with a round sheet-form conductive polymer 6; the variable resistance part 3 is placed in the center, with the heating part 5C provided surrounding its periphery. The electrode 4C, as the third electrode, is provided on one surface ~~both surfaces~~ of the heating part 5C.

The electrode 1 is provided on one surface (the upper surface side in FIG. 6) of the center section on the conductive polymer 6 forming the variable resistance part 3. The electrode 2 is provided on the other surface (the lower surface side in FIG. 6) forming the variable resistance part 3. The electrode 4C is provided on the other surface of the peripheral section of the conductive polymer 6 forming the heating part 5C. Between electrode 2 ~~the electrodes 1, 2~~ and the electrode 4 is provided an annular gap 8, from which the other surface of the conductive polymer 6 is exposed.

In the polymeric PTC thermistor with the above construction also, the momentum for activation is the same as in the first embodiment. However, according to the polymeric PTC thermistor with the above construction, the heating part 5C is provided ~~on~~ surrounding the variable resistance part 3 and heating of the variable resistance part 3 is enhanced because it

is heated from all sides so that the activating speed and accuracy of the switching operation are made higher.

Please delete the heading on page 11, line 6, as follows:

~~INDUSTRIAL APPLICABILITY~~

Please replace the paragraph beginning on page 11, line 7 by the following paragraph:

The present invention relates to a thermistor having a variable resistance part, whose resistance value changes in accordance with changes in temperature, between a first and a second electrode, the thermistor interrupting current between the first and second electrodes in response to changes in the resistance value of the variable resistance part, including: a third electrode placed so that it is not in contact with either the first or second electrode; and a heating part integrally formed with the same material as the variable resistance part and in contact with the third electrode, the heating part changing the resistance value of the variable resistance part by generating heat when current passes between the third electrode and either of the first or second electrodes ~~electrode~~. According to the thermistor of the present invention, the heating part, which is the element that heats the variable resistance part, is formed integrally with the same material as the variable resistance part, so that there are fewer components compared with a conventional thermistor that can interrupt current flow at a desired timing, and the construction is simplified while at the same time the module is made more compact so that the manufacturing cost may be kept low.

Please replace the Abstract on page 14 by the following amended Abstract:

A ~~This~~ thermistor is provided with a third electrode placed so that it is not in contact with either the first or second electrode, and with a heating part integrally formed with the same material as the variable resistance part and in contact with the third electrode, the heating part changing the resistance value of the variable resistance part by generating heat when current passes between the third electrode and either of the first or second electrodes ~~electrode~~.